

Journal of the Royal Society of Arts

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VOL. CIV

ELECTION OF CHAIRMAN OF COUNCIL

At the meeting of the Council held on 9th July, Dr. R. W. Holland, O.B.E., M.A., M.Sc., was unanimously re-elected Chairman of the Council for the coming year.

SIGN POSTS

The Special Activities Committee has recently discussed with officials of the Ministry of Transport a number of points connected with the lettering, placing and legends of street and road signs. In particular the Committee expressed criticism of sign-posts on country roads, on the score both of the position at which they are placed, which makes them often unreadable at night, and of the inconsistency and inaccuracy in the information they give.

The Ministry were satisfied that their new general scheme for sign-posting which is now in process of being applied throughout the country is adequate, but recognized that mistakes might be made in its application. They added that they would always be glad to hear any specific criticism and it was suggested that Fellows of the Society might be able to help in this matter.

Accordingly if any Fellow has any specific points of criticism to make in connection with either the siting of particular sign-posts or with the indications they carry and would care to let the Secretary know of these they will then be transmitted by him to the Ministry.

THE SOCIETY OF CHEMICAL INDUSTRY

The Society of Chemical Industry celebrated on 10th July the 75th anniversary of its foundation in 1881 and the Society was represented by Sir John Simonsen and the Secretary at a ceremony at which congratulatory addresses were presented. Following the precedent set by the Faculty of Royal Designers for Industry and the Royal College of Art at the Society's own Bicentenary, the Society presented its congratulations in the form of an engraved glass bowl and not as an Illuminated Address.

Sir John Simonsen also attended the 75th Anniversary Banquet on Wednesday, 11th July, and was invited to reply thereat to the toast of 'The Guests'.

MEETING OF COUNCIL

A meeting of Council was held on Monday, 9th July, 1956. Present: Dr. R. W. Holland (in the Chair); Dr. W. Greenhouse Allt; Sir Alfred Bossom; Sir Charles Dodds; Mr. P. A. Le Neve Foster; Mr. John Gloag; Sir Ernest Goodale; Mr. Milner Gray; Sir William Halcrow; Mr. A. C. Hartley; Sir Harry Lindsay; Mr. F. A. Mercer; Mr. Oswald P. Milne; Sir Selwyn Selwyn-Clarke; Sir John Simonsen; Mr. G. E. Tonge; Dr. Barnes Wallis and Sir Griffith Williams; with Mr. K. W. Luckhurst (Secretary) and Mr. David Lea (Assistant Secretary).

ELECTIONS

The following candidates were duly elected Fellows of the Society:

Balsom, Herbert Henry, New Barnet, Herts.
Batt, William L., C.M.G., M.E., D.Eng., Sc.D., Philadelphia, Pennsylvania, U.S.A.
Baxter, Thomas William, A.L.A., Salisbury, Southern Rhodesia.
Beard, Bernard Frederick, Belstone, Devon.
Bennett, Raymond Wordsworth, B.Sc., Calcutta, India.
Beukes, Pieter, M.A., B.Litt., Cape Town, South Africa.
Brown, Frederick, B.Sc., Brandon, Co. Durham.
Carter, John David Armishaw, London.
Darlington, Cyril Edward, T.D., B.Sc., A.M.I.Mar.E., Gateshead, Co. Durham.
Dunbar, Miss Evelyn Mary, A.R.C.A., Hinxhill, Kent.
Evans, Douglas Reginald, London.
Fiford, David Ernest, London.
Gilchrist, Charles William, Istanbul, Turkey.
Graham, Professor Victor Edward, B.S.A., M.S., Ph.D., Saskatoon, Saskatchewan, Canada.
Hammond, Richard Deaves, London.
Hay, Alexander, Glasgow.
Holt, Miss Constance Mary, Horsforth, Yorks.
James, Lionel David St., Bromley, Kent.
Knott, Joshua Robert, Welling, Kent.
Line, John, London.
Mahoney, Charles, A.R.C.A., Wrotham, Kent.
O'Neil, Commander Edgar Augustine, U.S.N.R., Englewood, New Jersey, U.S.A.
Peek, Geoffrey Walter, F.R.I.C.S., London.
Schary, Saul, New York, U.S.A.
Slattery, Brian George, Berkhamsted, Herts.
Smith, Alan Herbert, Kettering, Northants.
Walsh, Fred, A.R.C.A., A.T.D., Maidenhead, Berks.
Wanamaker, Professor John Frederick, M.A., Ph.D., Elsah, Illinois, U.S.A.
Webb, Thomas Basil, B.Sc., M.I.Mech.E., Hayes Common, Kent.

The following has been duly elected an Associate Member of the Society:

Stedman, John Edward, Sevenoaks, Kent.

BENJAMIN FRANKLIN MEDAL

The following were appointed in accordance with the provisions of a Council Resolution of 9th April, 1956, as a committee to select a name for the first award of the Benjamin Franklin Medal, which is due to be made in January, 1957: The Chairman of the Council: The Master of the Faculty of R.D.I.; Sir Ernest Goodale; the Earl of Halsbury and Mr. A. C. Hartley.

The question of a design for the medal was also considered.

LOCAL RATES

It was agreed that a Proposal for the exemption of the Society from liability for Local Rates under the Scientific Societies Act, 1843, should be lodged with the Local Valuation Officer forthwith.

OTHER BUSINESS

A quantity of financial and other business was transacted.

TWO HUNDRED AND SECOND ANNUAL GENERAL MEETING

WEDNESDAY, 4TH JULY, 1956

SIR ERNEST GOODALE, C.B.E., M.C., *a Vice-President of the Society,
in the Chair*

The Two Hundred and Second Annual General Meeting was held on Wednesday, 4th July, 1956, at 3 p.m., at the Society's House, in accordance with the Bye-Laws, for the purpose of receiving the Council's Report and the Financial Statements for 1955, and for the election of officers.

The Secretary read the Notice convening the meeting and proved that it had been duly exhibited and published, as required by the Bye-Laws.

Sir Ernest then explained that he was taking the Chair as both Dr. Holland, the Chairman of Council, and Mr. Munro Runtz, his immediate predecessor, were indisposed and the Earl of Radnor was out of London.

The Minutes of the last Annual General Meeting, held on 6th July, 1955, were then taken as read, the Secretary having summarized their contents, and were signed by the Chairman as a correct record.

The Chairman then called upon the Secretary to summarize the Annual Report of the Council:

ANNUAL REPORT OF THE COUNCIL

202nd SESSION, 1955-1956

I. HIS ROYAL HIGHNESS THE PRESIDENT

His Royal Highness the President has visited the Society's House on three occasions during the past year. On 26th October he came to present the R.D.I. Diploma to Mr. Uffa Fox and the Bicentenary Medal to Sir Charles Tennyson; on 7th December he attended the Annual Reception of the Faculty of Royal Designers for Industry and on 28th March he honoured the Society's Council by taking lunch with them in the Library.

On 9th November His Royal Highness received the Council at Buckingham Palace for the presentation to Dr. Vaughan Williams of the Albert Medal awarded to him last June.

II. ALBERT MEDAL

With the approval of the President, the Albert Medal for 1956 has been awarded to Sir Henry Dale, O.M., G.B.E., M.D., F.R.S., for 'eminent service to science, particularly physiology'.

III. ROYAL DESIGNERS FOR INDUSTRY

The following new appointment has been made to the Distinction:

Reynolds Stone, C.B.E. (*lettering*).

Mr. Milner Gray was elected Master of the Faculty for 1955/56 and Sir Francis Meynell, the immediate past-Master, served as Deputy Master.

In accordance with the practice established in 1954 a special meeting of the Society was held on 26th October for the presentation to Mr. Uffa Fox of his Diploma, and the Society and the Faculty were honoured by the presence at this ceremony of His Royal Highness The Duke of Edinburgh, who made the presentation. The presentation was followed by an Address by Mr. Milner Gray, Master of the Faculty, and afterwards His Royal Highness honoured the Faculty by taking luncheon with them at Kettner's Restaurant.

The Faculty held their sixth Annual Reception at the Society's House on 7th December and were again greatly honoured by the presence of His Royal Highness The Duke of Edinburgh.

The Faculty were represented by the present Master on the committee which organized the memorial exhibition, held at the Victoria & Albert Museum from 7th October to 24th November, 1955, of the work of the late E. McKnight Kauffer, the first recipient of the Honorary distinction of Royal Designer for Industry.

Miss Susie Cooper, a Member of the Faculty who is also a Fellow of the Society, has made a generous gift to the Society of a tea service for use in the Council Room.

IV. BICENTENARY MEDAL

The third Bicentenary Medal, which is for annual award to those who 'in a manner other than as industrial designers have exerted an exceptional influence in promoting art and design in British industry', has this year been awarded to Dr. W. J. Worboys, Chairman of the Council of Industrial Design.

The second Bicentenary Medal, which, as recorded in the last Annual Report, was awarded to Sir Charles Tennyson, C.M.G., was presented by His Royal Highness the President, as mentioned in Section 1 above.

V. PORTRAIT OF LORD RADNOR

The portrait of the Earl of Radnor, Chairman of Council during the Society's Bicentenary Year, which was commissioned by the Society as a permanent memorial of that occasion, has now been completed by Professor Rodrigo Moynihan, R.A., and is at present on exhibition at the Royal Academy. On the closing of the Summer Exhibition the portrait will be hung in the Society's library.

VI. ENDOWED PRIZES

Offers of prizes were again made this year under the Benjamin Shaw, Fothergill and Howard Trusts. One prize of £50 was awarded under the Howard Trust; one of £20 under the Benjamin Shaw Trust and one of £20 under the Fothergill Trust. Full details of the results of the competitions were published on page 797 of the *Journal* for 14th October, 1955.

VII. EXAMINATIONS—CENTENARY YEAR

The first examinations conducted by the Society were held in June, 1856, when 203 papers were worked by 52 candidates who attended at the Society's House in London, and came from Mechanics Institutes in various parts of the country. Now, the examinations are held at about 900 centres in all parts of Great Britain and Ireland and in various parts of the British Commonwealth, under the control of the local education authorities or of government-sponsored bodies. Examinations in English are also held at specially arranged centres in certain foreign countries, under the control of an official of the British Embassy or of the British Council.

Number of Entries

In this, the centenary year of the examinations, it is very gratifying to be able to report once again a record number of entries for the various examinations conducted by the Society. The table of subject-entries which follows shows that the record total of last year has been exceeded by 15,548.

	1955-56	1954-55
(a) Ordinary (Single-subject) Series	153,173	142,622
(b) Oral Tests	4,551	3,465
(c) School and Senior School Commercial Certificates ...	16,398	14,952
(d) Grouped Course	16,201	12,961
(e) Road Transport Subjects	1,256	1,142
(f) Teacher's Certificate in Shorthand	618	652
(g) Teacher's Certificate in Typewriting	413	403
(h) British Transport Commission (Preliminary examination of candidates under Apprenticeship Schemes) ...	1,146	1,976
(i) British European Airways (Special proficiency tests in Shorthand and Typewriting)	117	128
(j) Royal Air Force Administrative Apprentices (Scheme of endorsement of certificates awarded by the Air Ministry)	125	149

	193,998	178,450
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Centenary Prizes

To mark the occasion of the centenary of the first examination the Council have approved the award of special Centenary Prizes to candidates submitting the best papers in certain subjects, or groups of subjects, at the combined Easter, Whitsun and Summer Series of 1956. In addition to the cash prizes, the successful candidates will receive specially inscribed certificates.

Negotiations with the Ministry of Education

In November, 1954, the Council submitted a resolution to the Ministry of Education on the subject of examinations for secondary schools, and last January a deputation of the Council was received by officials of the Ministry when the resolution was discussed in detail. The reply from the Ministry was incorporated in Circular 289 (see Report on Examinations, published in the *Journal* for 11th November, 1955). In March, 1956, the Society submitted to the Ministry their detailed comments on the points raised in Circular 289, and reiterated their recommendation that, at the discretion of the head teacher, pupils of secondary schools in their sixteenth year should be allowed to take appropriate examinations such as those conducted by the Society and by bodies of similar standing.

Miscellaneous

Six Silver Medallists at the Society's examinations in 1955 have been elected to Associate Membership.

The Worshipful Company of Clothworkers has again generously contributed towards the cost of the silver and bronze medals.

A fuller report on the Society's examinations during the past year will be published in the *Journal* in the autumn.

VIII. INDUSTRIAL ART BURSARIES COMPETITION

The Society's annual competition for the award of travelling bursaries to students of industrial design shows by its continued expansion that it is rendering an important service to art schools and industry.

The competition held during 1955 was divided into 15 sections (two more than in 1954), covering the following fields of industrial design respectively, namely: *domestic electrical appliances, electric light fittings, domestic gas appliances, domestic solid-fuel-burning appliances, carpets, dress textiles, women's fashion wear, furnishing textiles, acrylic sheet ('Perspex') articles, laminated plastics, P.V.C. plastics sheeting, footwear, furniture, jewellery and wall-paper.*

Three Bianca Mosca awards, totalling £350 in value, and ten ordinary bursaries of £150 and seven of £75 each, have been awarded to successful candidates. The 13 bursary winners who were eligible for the award of Associate Membership have now been elected.

Candidates were required both to undergo a set test carried out under invigilation, and also to submit with the work done in that test examples of work done by them in the ordinary course of their studies. An illustrated report of the competition was published, of which a summary was included in the *Journal* for 2nd March, 1956, and the usual exhibition of winning and commended designs was held in the Society's House in May. The exhibition was formally opened for the first time since the war, the opener being the Rt. Honble. Sir David Eccles, K.C.V.O., M.P., Minister of Education. A further touch of brilliance was given to the display by the use of a set of new lighting fittings which have been acquired for the Society's exhibition screens through the J. A. Milne bequest. Immediately after the closing of the exhibition at the Society's House the designs were removed to Olympia for inclusion in the Production Exhibition and Conference promoted by the Institution of Production Engineers, where they created a great deal of interest, and arrangements have also been made for further showings in Falmouth, Belfast and Birmingham, following last year's practice whereby the exhibition was shown in Canterbury, Gloucester and Worthing.

Nineteen of the candidates successful in previous competitions made tours abroad during the year. Most of them visited Scandinavia, France or Italy, and other countries visited were Holland, Norway, Switzerland and Western Germany; a number of the candidates also undertook courses of study and visited various factories and studios in this country. Details of all these tours and courses were included in the report mentioned above. Of the winning candidates in the most recent competition, eight have already begun their tours on the Continent; and the remainder will be setting out either later this year or in the spring of 1957. Arrangements have also been made for two of the commended candidates to gain practical experience by visiting factories in this country.

The Council wish to express once again their appreciation of the generous

donations from industrial bodies and firms which make this competition possible, and which encourage them and the Bursaries Board in their firm belief that the competition is worth while. It has accordingly been decided to organize a similar competition during the present year, and to offer awards of the total value of £3,350, of which £3,135 has already been subscribed or promised, for design in 17 different industrial fields, thus showing a still further expansion. All the sections included in the 1955 Competition will again be represented, with the exception of that for domestic gas appliances, and in addition there will be three new sections, for the design of domestic glassware, pottery and cinema and television settings. Details were given in an announcement published in the *Journal* for 11th May, 1956.

IX. THOMAS GRAY MEMORIAL TRUST

Prizes for Ships' Apprentices

Fifteen prizes, of a total value of £74 17s. 4d., were awarded in connection with the examinations conducted by the Merchant Navy Training Board. The prizes consisted of five silver medals, five bronze medals and five nautical instruments.

Scholarships for Deck-Boys and Young Seamen

In 1955 the Trust made a grant of £100 towards the provision of scholarships for deck-boys and young seamen, which are mainly financed by the Trust but administered by the Seafarers' Education Service, and 18 scholarships were awarded. These scholarships take the form of a four-year correspondence course together with the necessary text books and it is estimated that about one in ten who rise from deck status are now scholars under this scheme.

Training Ship Prizes

Prizes, to a total value of £30, offered to the training ships *Indefatigable*, *Arethusa* and *Mercury* for the boy in each ship who, in the opinion of his officers, would make the best sailor, were awarded to W. W. Hampson of *Indefatigable* (£10), Brian George Britnell and Robert Tullett of *Arethusa* (£5 each), and Roger Thrussell of *Mercury* (£10). The silver medal offered as a navigation prize in the South African Nautical College *General Botha* was awarded to Ellard Krauss.

Extra Master's Certificate Examinations

The Silver Medal offered to the candidate who obtained the highest marks in the Ministry of Transport's Examinations for the Extra Master's Certificate in 1955 has been awarded to Mr. William Stanley Gordon Morrison.

Thomas Gray Memorial Bursaries Scheme

Three bursaries were awarded in 1955 under the Thomas Gray Memorial Bursaries Scheme to cadets from the School of Navigation, Southampton, H.M.S. *Conway* and H.M.S. *Worcester* respectively. The scheme, which is now in its third year, gives help to cadets in financial difficulties who without it might be compelled to abandon their training.

Deed of Professional Merit

Seven submissions were received in connection with the offer of an award of £50 for a deed of outstanding professional merit performed by a member of the British Mercantile Marine between October, 1954, and September, 1955, and on the unanimous recommendation of the Judges the award was made to Chief Officer C. S. Owston of the M.S. *Liparus* for the skill which he had shown as officer in charge of a life-boat concerned in a rescue operation in St. George's Channel.

X. EVENING DISCUSSION MEETINGS

Although the attendances at the three Evening Discussion Meetings held in the last Session were not very encouraging, the Council decided to hold a further experimental series on the same lines in the present Session. Three meetings were held in the Library, on 1st February, 29th February and 28th March respectively, under the supervision of the Special Activities Committee, and the Society was again most fortunate in the speakers who opened each discussion.

At the first meeting Mr. Raymond Spottiswoode introduced the subject of 'Recent Developments in Cinema Technique'; at the second Mr. Denzil Batchelor, Sports Editor of *Picture Post*, introduced the subject of 'Sport—with some reference to the growth of professionalism'; and at the last meeting Dr. Stanley Gooding was the opening speaker on 'The Use of Leisure'.

The primary object of the meetings, as in the previous Session, had been to provide an opportunity for informal discussion, particularly by younger members of the Society, many of whom are not able to attend Ordinary Meetings in the afternoon. Unfortunately, however, the number of younger members in the audience was, in both series, disappointing, and the attendance was considerably reduced in the three meetings this year. The Council have therefore decided not to continue the experiment for another Session although an occasional informal discussion may be arranged, should a suitable subject present itself.

XI. MARKET RESEARCH CONFERENCE AND ESSAY COMPETITION

The effort made by the Society last year, in organizing an essay competition, to advocate market research as an essential means of improving the export trade of Great Britain, was continued and the Society held a one-day Conference on this subject in November. It was supported by the Association of British Chambers of Commerce, the British Export Trade Research Organisation, the Federation of British Industries, the Institute of Export and the National Union of Manufacturers.

The Conference was opened by the Right Honble. A. R. W. Low, the Minister of State at the Board of Trade, and Sir Ernest Goodale, Mr. Leslie Gamage and Mr. Roger Falk took the chair at various stages of the proceedings. The speakers included Mr. Lincoln Steel, Mr. Martin Maddan and Mr. Alastair

Sedgwick, and the Conference was fully attended by a large number of Directors from small and large firms interested in export questions all over the country.

At the end of the Conference the prize of £500, which had been offered in the 1955 Essay Competition and provided by the British Export Trade Research Organisation, was presented to the winner, Mr. Peter Clare Beauchamp, the Assistant Market Information Officer of a London firm of manufacturing chemists. Altogether 25 essays were submitted, and an additional prize of £25 was awarded to Mr. Garth Edward Glasson, a South African employed by a firm of lace exporters in Nottingham.

The Essay was published in the *Journal* for 25th November, 1955.

XII. BENJAMIN FRANKLIN CELEBRATIONS

The Society, which has been in touch for some time with other interested organizations, took an active part in the recent celebrations of the 250th Anniversary of the birth of Benjamin Franklin.

On 11th January the Society was represented by the Chairman of Council and the Secretary at a memorable ceremony at Franklin House, Craven Street, which was Franklin's London home, when one of two Franklin medals struck by the City of Philadelphia was presented by the Mayor of that city to Sir Winston Churchill.

On 18th January it was the turn of the Society to receive a medal. At the close of the Trueman Wood Lecture by Professor E. N. da C. Andrade on 'Benjamin Franklin in London', Dr. Myron Koenig, the Chief Cultural Attaché (in the absence in the United States of the American Ambassador), presented the medal struck by the United States Congress for award, primarily, to the various bodies still existing of which Franklin was a member. The medal (which was described and illustrated on page 234 of the *Journal* for 3rd February, 1956) was accepted on behalf of the Society by the Chairman of Council, Dr. R. W. Holland.

The Society is itself now preparing a Benjamin Franklin medal, which will serve to commemorate not only the 250th anniversary, just past, of Franklin's birth but also the 200th anniversary, in September, of his election to membership of this Society. This medal will be for award annually 'to individuals who have attained early distinction, with promise of further achievement, in the promotion of arts, manufactures and commerce'.

This year of celebration has also been a most appropriate occasion for an interesting exchange of early documents connected with Franklin between the Royal Society of Arts and the American Philosophical Society, which was founded by Franklin in Philadelphia in 1743. Details of this transaction were published on page 534 of the *Journal* for 8th June, 1956.

XIII. EXHIBITION OF EUROPEAN MEDALS

The 'Exhibition of European Medals', 1930-1955, which was organized by the Society and displayed at the Society's House in June, 1955, has since been shown

in museums or art galleries in the following cities: Sheffield, Norwich, Lincoln, Leicester, Edinburgh and Cardiff. Appreciative messages describing the considerable interest aroused by the Exhibition have been received from the heads of each of the institutions concerned.

The Exhibition has now been dispersed.

XIV. FILM EVENINGS

Film Evenings have once again attracted large audiences of Fellows and their guests. Four programmes were arranged during the session and, as has been the custom since the programmes commenced, in most cases the producers or directors of the films screened were present to introduce their films.

The programmes included *The Rival World*, *Thursday's Children*, *Heart of England*, *Man with a 1,000 Hands*, *Elizabethan Express*, *Magic Strings* and the film record of Captain Scott's ill-fated Antarctic Expedition, *Ninety Degrees South*.

XV. SCIENCE AND INDUSTRY COMMITTEE

The Science and Industry Committee, which was initiated by the British Association and since 1954 has been sponsored jointly by the Society, the Association and the Nuffield Foundation, has continued its investigations into the possibility of speeding-up the application to industry of the results of scientific research, and is now actively engaged in the preparation of its Report, which it is expected will be published in the Spring of 1957.

XVI. PAXTON MEMORIAL TRUST

In the Joint Report, published on 20th December, 1955, of the General Purposes Committee and the Parks Committee of the London County Council on the subject of 'Crystal Palace Development', reference was made to the proposed provision in the Crystal Palace grounds of a memorial to Sir Joseph Paxton, the originator of the old Crystal Palace, and the report added, as a result of a suggestion made some time ago by the Society, that this subject 'is one in which we understand that the Royal Society of Arts might be willing to co-operate in certain respects'. The Society is now engaged in active discussions with a view to the organization of a competition for designs for the garden which will be the main feature of the proposed memorial.

XVII. PURCHASE TAX ON MEDALS

A reference made by the President of the Royal Academy, when opening the Society's Exhibition of European Medals, to the serious inhibiting effect of purchase tax on this form of art was considered by the Special Activities Committee and recommended to the Council as a matter in which the Society might appropriately take action. Representations were accordingly made in the appropriate quarters and, at the suggestion of the Society, similar representations

were also made by the President of the Royal Academy and the President of the Royal Society of British Sculptors. The immediate outcome of this action was merely to establish the fact that bronze medals were then, subject to certain conditions, free from purchase tax, a fact that was not fully appreciated by all concerned. Since then, however, the Chancellor of the Exchequer has found it possible, in his autumn (1955) budget, similarly to free gold and silver medals from tax, subject to the same conditions.

XVIII. IMPERIAL INSTITUTE

At its March and April meetings the Council had under consideration the proposal to demolish the building of the Imperial Institute in order to make way for the extension of the Imperial College of Science. As a result of their deliberations the Council decided to address a letter to the Lord President of the Council, the Rector of the Imperial College of Science and Technology, the Clerk of the London County Council and the Secretary of the Royal Fine Art Commission. This letter, the text of which was published on page 397 of the *Journal* for 13th April, 1956, appealed for further consideration to be given 'to the possibility of adapting at least the tower and *façade* to the uses of the enlarged Imperial College'.

It has now been announced by Mr. Henry Brooke, Financial Secretary to the Treasury, that the revised plans for the development of the Imperial College permit the retention of the tower as a free-standing *campanile* (see the *Journal* for 6th July, 1956).

XIX. COLLABORATION WITH OTHER ORGANIZATIONS

The Council wish to express the pleasure which they have experienced in again collaborating with other organizations in various matters during the past year. These include the erection of a memorial to John Nash at All Souls' Church, Langham Place, now reaching fruition, the arrangements for the recent Franklin 250th Anniversary Celebrations and the Perkin Centenary Celebrations, the organization of the McKnight Kauffer Memorial Exhibition, the Science and Industry Committee (referred to in Section XV above) and the Conference on Export Market Research.

XX. THE LIBRARY

The Society's Archivist, Mr. D. G. C. Allan, was appointed Curator-Librarian in succession to Miss M. L. Clark. Work on the loose archives is continuing, and some bound volumes of eighteenth-century letters are also being indexed.

The limit of the holding capacity of the Library having been reached, a number of redundant works have been disposed of. An explanation of the policy which will be followed in future acquisitions for the Library was published in the *Journal* for 11th May, 1956.

The basement immediately below the Library has been thoroughly cleaned and redecorated. Fluorescent lighting and an electric ventilator have been fitted, and it can now be used as an emergency reading room,

The Library has received a number of generous gifts and bequests, the most notable being the legacy from the late Mrs. N. W. Michael, to be known as the *Fred Henry Andrews Trust* (see Section XXIV below). Books presented include nine volumes of the *Survey of World Textiles*.

XXI. THE SOCIETY'S CHRISTMAS CARD

For the seventh successive year the Society produced a special Christmas card in 1955 for the use of Fellows, and the record number of 25,000 was sold. The subject was what is believed to be the first Christmas card produced in this country. It was published by Henry Cole in 1843. As Fellows will remember, Cole was Chairman of the Council of the Society in 1850, and again in 1852.

XXII. FELLOWSHIP

It was hardly to be expected that the last 12 months would compare favourably as regards increase in membership with the previous year, when public attention was focussed upon the Society because of the Bicentenary. However, the number of Fellows on the roll after the Council meeting in June was 6,228, as compared with 6,216 at the corresponding period of 1955. Considering present circumstances this small increase is, taken by itself, not unsatisfactory, but, as is stressed elsewhere, the Society, like its members and potential members, is feeling the pinch of inflation, and if it is to fulfil the rôle for which its present size and prestige qualify it, a continuing increase of income, by subscriptions, is seriously needed. The Council therefore earnestly hope that Fellows will make it a matter of concern to propose for election the names of persons whom they consider suitable.

XXIII. OBITUARY

By their death during the past year the Society unhappily lost the valuable services of two Members of its Council—Sir Atul Chatterjee, a Vice-President, who had served continuously from 1928 to the time of his death and was Chairman in 1939-40, and Lord Horder who was re-elected to the Council only a little more than a month before he died. It also regrets the loss of two former Vice-Presidents, Mr. W. H. Berry and Sir Montague Hughman, the senior Honorary Corresponding Member, Colonel N. T. Belaiew, who had served since 1917 as Honorary Corresponding Member in Paris, and a member of the Commonwealth Section Committee, Sir Alexander Murray. In addition, the Society has been deprived of some of its members of longest standing, including, Mr. A. E. Habershon (1891), Sir Spencer Portal (1892), Sir William Himbury (1896), the Earl of Harrowby (1901) and Mr. H. R. Abercrombie (1904).

Other obituary notices published in the *Journal* included those of Lord Altrincham, Sir Charles Bartlett, Sir Charles Dundas, Sir Alexander Korda, Sir David Russell, Mr. A. V. Sugden, Dr. S. Whitehead and Mr. J. H. Whitehouse.

XXIV. THE FRED HENRY ANDREWS TRUST

Under the Will of the late Mrs. N. W. Michael the Society has received a bequest of £1,000 for the establishment of a Trust the income from which is to be used for the purchase of books for the Library. This Trust bears the name of Mrs. Michael's father, Mr. Fred Henry Andrews, who has served on the Society's Council almost continuously since 1935.

XXV. NEW COUNCIL

The death of Lord Horder, and the resignation owing to ill health of Mr. William Will, created two vacancies in the Council list during the year. These were filled by Mrs. Mary Adams and Professor Sir Charles Dodds.

In accordance with the Bye-Laws four Ordinary Members of Council must resign at the Annual General Meeting—the two senior, and two by reason of least attendance. These four are Mr. F. H. Andrews, Professor Sir Albert Richardson, Mr. A. R. N. Roberts and Mr. J. G. Wilson, and it is recommended that their places should be filled by Sir Henry Cohen, Sir William Halcrow, Mr. G. E. Tonge and Dr. B. N. Wallis.

XXVI. HONORARY CORRESPONDING MEMBERS IN NORTH AMERICA

The Council have recently been giving special attention to the fostering of an interest in the Society's work in the British Commonwealth and in the United States of America and have, during the past year, appointed four additional Honorary Corresponding Members in Canada and an Honorary Corresponding Member for the North-Eastern States of the United States. Details of these appointments were published in the issues of the *Journal* for 28th October, 1955 and 6th January, 1956.

XXVII. STAFF

As reported above, Miss M. L. Clark has resigned her appointment as Librarian and has been succeeded by Mr. D. G. C. Allan, previously the Society's Archivist, as Curator-Librarian.

XXVIII. LOCAL RATES

The Council have been giving careful consideration to the Society's position regarding local rates both under Section 8 of the Rating and Valuation (Miscellaneous Provisions) Act, 1955, and the Scientific Societies Act of 1843.

XXIX. FINANCE

The Income and Expenditure Account for 1955 shows an excess of income over expenditure of £3,862, as compared with £2,274 in 1954, which certainly gives cause for satisfaction. Nevertheless, it must be stressed that since the end of 1955 increases have taken place in the cost of producing and posting the *Journal*, and also in salaries, wages and superannuation and general expenses, so that the accounts for the current year are likely to show a far less rosy outcome. In the light of these circumstances the Council are, of course, exercising a very careful supervision over all expenditure.

XXX. STANDING COMMITTEES

A list of those appointed to serve on the various standing committees of the Society, and of the Society's representatives on the governing bodies and committees of certain other organizations, was published in the *Journal* for 25th November, 1955.

XXXI. PAPERS AND LECTURES

The unspecialized nature of the Society enables it to cover a wide field of interesting and important subjects, and the Society is fortunate to receive the support of distinguished lecturers who are willing to devote valuable time to preparing papers for publication in the Society's *Journal* and to reading them at its meetings. To these it is deeply indebted and sincerely grateful.

Last Session's programme maintained the usual high standard, and the subjects dealt with ranged from historical accounts of Benjamin Franklin, John Flaxman and Sir Joshua Reynolds to the latest developments in television and automation.

The full list of papers and lectures is as follows:

A. ORDINARY MEETINGS

Chairman's Inaugural Address

ART IN EDUCATION. *Dr. R. W. Holland* (page 6)

Trueman Wood Lecture

BENJAMIN FRANKLIN IN LONDON. *Professor E. N. da C. Andrade* (page 216)

Peter Le Neve Foster Lecture

ELECTRONIC PHOTOGRAPHY. *C. G. Mayer* (page 578)

Alfred Bosson Lecture

PLANNING AGAINST NOISE. *H. Bagenal* (page 303)

E. Frankland Armstrong Memorial Lecture

RESEARCH IN INDUSTRY. *Dr. B. K. Blount* (page 108)

Pope Memorial Lecture

THE DEBT OF CHEMISTRY TO MEDICINE. *Professor Sir Charles Dodds* (page 671)

Fernhurst Lecture

INSECT PHYSIOLOGY IN RELATION TO INSECTICIDES. *Professor. V. B. Wigglesworth* (page 426)

Inaugural Fred Cook Memorial Lecture

THE LIFE AND WORK OF SIR JOSHUA REYNOLDS, P.R.A. *A. Gwynne-Jones*
(8th February)

*Papers**Special Meeting*

(Presentation of R.D.I. Diplomas and the Bicentenary Medal.) Oration
THE CREATIVE URGE. *Milner Gray* (page 14)

Ordinary Meetings

JOHN FLAXMAN, R.A. (1755-1826). *Dr. John Thomas* (page 43)
PUBLIC RELATIONS AND ADVERTISING TODAY. *Sir Stephen Tallents* (page 194)
SCIENTIFIC ASPECTS OF THE DETECTION OF CRIME. *Dr. L. C. Nickolls* (page 181)
LATIN-AMERICAN ARCHITECTURE. *Professor Henry-Russell Hitchcock* (page 344)

Symposium of three papers on A NEW APPROACH TO FURNITURE DESIGN

RESEARCH IN THE FURNITURE INDUSTRY. *M. J. Merrick* (page 368)
ITS APPLICATION TO FURNITURE CONSTRUCTION. *T. Kotas* (page 373)
ITS EFFECT ON THE CHARACTER OF FURNITURE. *Robin Day* (page 379)
DESIGNING FOR TELEVISION. *F. H. K. Henrion* (page 439)
THE ARITHMETIC OF THE MUSICAL SCALE. *L. H. Bedford* (page 465)
THE BRITISH GLASSHOUSE INDUSTRY. *Dr. W. F. Bewley* (page 515)
A NEW CONCEPT IN THEATRE DESIGN. *Norman R. Branson* (29th February)
THE TOURIST INDUSTRY. *J. G. Bridges* (page 567)
T. H. HUXLEY AND TECHNICAL EDUCATION. *Dr. Cyril Bibby* (18th April)
BEAUTY IN DANGER—THE RURAL SCENE. *Sir George Pepler* (page 609)
BEAUTY IN DANGER—THE URBAN SCENE. *Professor Sir Hugh Casson* (page 627)
AUTOMATION. *Lord Halsbury* (page 535)
EXAMINATIONS: DO WE STILL NEED THEM? *Sir Griffith Williams* (30th May)
THE INFLUENCE OF NATIONAL CHARACTER ON DESIGN. *Paul Reilly* (6th June)
PEATY TERRAIN: ITS INFLUENCE AS A FACTOR CONTROLLING DEVELOPMENT IN
GREAT BRITAIN AND CANADA. *Professor Norman W. Radforth* (3rd July)

B. COMMONWEALTH SECTION

Eight papers and lectures were delivered to the Commonwealth Section during the Session.

Thomas Holland Memorial Lecture

THE WORK OF THE COLONIAL DEVELOPMENT CORPORATION. *H. Nutcombe Hume*
(12th April)

Neil Matheson McWharrie Lecture

THE THEATRE AND BALLET IN CANADA. *Robert Speaight* (29th May)

Henry Morley Lecture

RECENT DEVELOPMENTS IN TRADE AND INDUSTRY IN PAKISTAN. *His Excellency*
Mr. Mohammed Ikramullah (page 501)

Papers

THE GEZIRA SCHEME *Arthur Gaitskell* (page 67)

AN ACCOUNT OF THE RECENT COMMONWEALTH TOUR. *Lord Home* (Joint Meeting with the East India Association and the Pakistan Society) (page 191)

SOME SOCIAL EFFECTS OF TROPICAL MEDICINE WITHIN THE COMMONWEALTH. *Dr. R. S. F. Hennessey* (page 332)

RECENT DEVELOPMENTS IN THE FEDERATION OF RHODESIA AND NYASALAND. *Sir Gilbert Rennie* (page 399)

THE SNOWY MOUNTAINS SCHEME. *C. M. Gray* (26th April)

C. CANTOR LECTURES

The following courses were delivered during last Session:

THE SCIENCE OF BREWING. *Dr. A. H. Cook* (page 243)

MODERN WELDING. *Dr. H. G. Taylor* (16th, 23rd, 30th April)

SOME RECENT STUDIES OF SOCIOLOGY:

Class Conflict and Social Mobility. *Professor T. S. Simey* (7th May).

Some Aspects of the Development of Demography. *Professor David V. Glass* (14th May)

Changes in Social Responsibilities. *Dr. Roger F. Tredgold* (28th May)

D. DR. MANN JUVENILE LECTURES

Two Juvenile Lectures were given during the Christmas holidays as follows:

CLOCKS AND WATCHES—HOW THEY WORK. *A. W. Marshall* (page 322)

THE HISTORY OF THE CIRCUS. *Antony D. Hippisley Cox* (page 414)

XXXII. MEDALS FOR PAPERS

The Council have awarded Silver Medals for the Session 1955-1956 to the following lecturers:

For Papers read at Ordinary Meetings

Professor Henry-Russell Hitchcock. 'Latin American Architecture'

Dr. W. F. Bewley. 'The British Glasshouse Industry'

Dr. Cyril Bibby. 'T. H. Huxley and Technical Education'

For Papers read at Meetings of the Commonwealth Section

Arthur Gaitskell. 'The Gezira Scheme'

C. M. Gray. 'The Snowy Mountains Scheme'

Before moving the adoption of the Annual Report the Chairman spoke of the wide field of activity covered by the Society. He drew particular attention to the personal and active part which the President played in its work, and to the institution of the Benjamin Franklin Medal.

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C. M. Gray. 'The Snowy Mountains Scheme'

Before moving the adoption of the Annual Report the Chairman spoke of the wide field of activity covered by the Society. He drew particular attention to the personal and active part which the President played in its work, and to the institution of the Benjamin Franklin Medal.

The adoption of the Report having then been formally moved by the Chairman and formally seconded by Sir Edward Crowe, the Chairman invited questions upon it.

MISS VIOLET PAIN: What is the position about the assessment on this building?

THE SECRETARY: Under the provisions of the recent act, for the next few years at any rate our assessment is so raised that in effect the amount of rates payable will be the same as they were last year.

THE CHAIRMAN: We have also appealed, unsuccessfully, to the rating authority to exercise its discretion under the recent Act to remit our rates, and at the same time we are taking steps to claim exemption under the Act of 1843 dealing with the rating of the scientific societies.

The motion that the Annual Report should be adopted was then put to the meeting and carried unanimously.

The Chairman then called on Mr. P. A. Le Neve Foster, the Senior Treasurer, to move the adoption of the Accounts for the year ending 31st December, 1955.

MR. LE NEVE FOSTER: The Financial Statements have been published in the *Journal* and you will have seen from the report that we have got a surplus of income over expenditure of £3,862 and that this is rather larger than the surplus we had the previous year when it was £2,274.

I do not think you would want me to burden you with a lot of details about the accounts, but if you look at the Income and Expenditure account you will see that though our income has increased, the cost of running the Society has also increased. During a period of rising costs this is, I think, inevitable. On the other hand I think that the fact that the Accounts do show a surplus at a time when the cost of administering the Society is increasing does indicate that the Society's finances are in a healthy state and I would like formally to move the adoption of the Accounts.

Mr. H. G. Lowder having formally seconded their adoption, the motion that the Accounts be adopted was put to the meeting and carried unanimously.

The list of nominations having been exhibited in the Library in accordance with the Bye-Laws, and no additional nominations having been made, the Chairman called on the Secretary to announce the new Council for 1956-1957, which was done as follows (names in italics are of Fellows who have not served on the previous Council):

PRESIDENT

His Royal Highness The Duke of Edinburgh, K.G.

VICE-PRESIDENTS

Sir Edward Crowe, K.C.M.G.

Sir Ernest Goodale, C.B.E., M.C.

Robert W. Holland, O.B.E., M.A., M.Sc., LL.D.

Sir Harry Lindsay, K.C.I.E., C.B.E.

The Earl of Radnor, K.C.V.O.

E. Munro Runtz, F.R.I.C.S.

Milner Gray (*Master of the Faculty of Royal Designers for Industry*).

ORDINARY MEMBERS OF COUNCIL

W. Greenhouse Allt, D.Mus., F.R.C.O., F.T.C.L.	Lord Nathan, P.C., T.D., D.L., J.P., F.S.A.
Mrs. Mary Adams, O.B.E., M.Sc.	Sir William Ogg, M.A., Ph.D., LL.D.
<i>Professor Sir Henry Cohen, M.D., F.R.C.P.</i>	Sir Harold Saunders, F.C.G.I., B.Sc.(Eng.).
Professor Sir Charles Dodds, M.V.O., M.D., F.R.C.P., F.R.S.	Sir Selwyn Selwyn-Clarke, K.B.E., C.M.G., M.C., M.D., F.R.C.P.
Robin Darwin, C.B.E., Hon.A.R.C.A.	Sir John Simonsen, D.Sc., F.R.I.C., F.R.S.
John Gloag, Hon.A.R.I.B.A.	Professor L. Dudley Stamp, C.B.E., D.Lit., D.Sc.
<i>Sir William Halcrow, M.I.C.E., M.I.Mech.E.</i>	Sir Stephen Tallents, K.C.M.G., C.B., C.B.E.
The Earl of Halsbury, F.R.I.C., F.Inst.P.	<i>G. E. Tonge.</i>
A. C. Hartley, C.B.E., B.Sc., F.C.G.I., M.I.C.E., M.I.Mech.E.	<i>Barnes Neville Wallis, C.B.E., D.Sc., R.D.I., F.R.S.</i>
William Johnstone, O.B.E., D.A.	Sir Griffith Williams, K.B.E., C.B.
Lord Latham, J.P.	Miss Anna Zinkeisen, R.O.I., R.D.I.
F. A. Mercer, Hon.F.S.I.A.	
Oswald P. Milne, J.P., F.R.I.B.A.	

TREASURERS

Sir Alfred Bossom, Bart., LL.D., J.P., F.R.I.B.A., M.P.
P. A. Le Neve Foster.

THE CHAIRMAN: I would like to interpose here, particularly as the last two names mentioned were those of our Treasurers. It has occurred to me in the course of this meeting that we do not really give expression publicly to our appreciation of the work which our Treasurers do for the Society. Mr. Peter Le Neve Foster has said that the Accounts are in a healthy state and I think that is true, and it is very largely due to the work which our Treasurers do. It is quite often true that the post of Honorary Treasurer is very much of a sinecure, but I can assure you that in this Society the Treasurers do really address their minds to the financial affairs of the Society and I think it is for that reason that those are in such good shape. I would like to propose to the meeting that we do here and now pass a very hearty vote of thanks to Mr. Peter Le Neve Foster and to Sir Alfred Bossom for their work as Treasurers of the Society.

The vote of thanks was carried unanimously.

THE CHAIRMAN: I also want to claim the privilege of proposing a motion that is an annual event, but it is nevertheless an important one and a sincere one: that is, a vote of thanks to the staff for their work during the past year. There has been no Bicentenary or other celebration in the year which has highlighted the work of the staff, but that does not mean that they have not been just as busy as in previous years. There has been a ceaseless round of activity: we had the Medals Exhibition and the Bursaries Exhibition and so on, and I can assure you that the Secretary and his staff do work very hard. As regards the Examinations staff, there is the increase in the number of papers worked which obviously

throws an added burden on the staff, especially the senior staff and I am sure the members do really appreciate the devoted service that is paid to the work of the Society and to the Examinations by its staff. We hope that the pressure at the Examinations Department will be relieved a little bit by an adjustment of accommodation which is under consideration and that they will be able to do their work in more congenial surroundings. If my remarks are brief they are none the less sincere. I have much pleasure in proposing to you a very warm vote of thanks indeed to Mr. Luckhurst and to the whole of his staff for their work during the past 12 months.

The vote of thanks was carried unanimously.

THE SECRETARY: Mr. Chairman, I wish to express the thanks of myself and all members of the staff for the kind words in which you, Sir, have proposed this vote of thanks and for the very kind response of the audience. I do assure you that we are greatly encouraged by the many tokens of appreciation which we receive from the Council and from the Society. One token of the Council's appreciation has for a number of years been that they have very kindly given the staff a Christmas party, and I think I should mention that this year we had a change and instead of just having a party here the Council agreed to our going to the circus! I have amused myself by going back over past history and contemplating some of my predecessors taking a party of their colleagues on the staff to such a performance. William Shipley, I am sure, would greatly have enjoyed it because you may remember that he got the idea for founding the Society by standing at the horse fair at Northampton and gazing on the wonderful beasts that were displayed there. On the other hand, when I look up from time to time and see the stern face of Sir Henry Trueman Wood looking down on me, I find it difficult to picture him going top-hatted from the Athenæum to join the rest of the staff at the circus! But, to speak more seriously, may I take this opportunity of saying how much we are helped in the staff not merely by annual expressions of appreciation such as this, but also by the constant readiness of all members of Council to give us assistance in our work. I realized nothing more rapidly when I came to this Society than that: that the members of Council are our real friends and always seem ready to put everything else down in order to give us their help. It makes all the difference to our work, and whatever success there may be in our work is so largely due not merely to its formal direction by the Council but also to the friendly, personal advice of its members.

SIR FRANK BROWN then proposed a vote of thanks to the Chairman of Council, Dr. Holland, for his untiring efforts on behalf of the Society and to Sir Ernest Goodale for deputizing for him so ably at the meeting.

The vote of thanks was carried with acclamation, and the meeting then ended and tea was served in the Library.

THE DEBT OF CHEMISTRY TO MEDICINE

The Pope Memorial Lecture by

SIR CHARLES DODDS, M.V.O., M.D., D.Sc., F.R.C.P., F.R.S.,
*Courtauld Professor of Biochemistry, University of
London at Middlesex Hospital Medical School,
delivered to the Society on Wednesday, 7th March,
1956, with Sir Cyril Hinshelwood, M.A., D.Sc.,
P.R.S., Dr. Lee's Professor of Chemistry, University
of Oxford, in the Chair*

THE CHAIRMAN: Medicine, as we all know, is partly an art and partly a science, and perhaps we are not all quite so familiar with the fact that although chemistry is partly a science, it is also largely an art. The relative proportions of art and science, both in chemistry and medicine, change with circumstance and the time in which we live. The mutual influence of the two is a matter of very great interest both to the historian of science and, of course, to anyone who is interested in the processes of scientific thought and discovery. That is one of the reasons why the lecture by Sir Charles Dodds this afternoon is a matter of very great importance and interest to many of us.

There are few people who are so well qualified as Sir Charles is to speak on the subject. He is a distinguished biochemist whose own work, especially in the field of hormones and related substances, could itself really form a basis for practically a whole lecture on this subject. I do not know, of course, how he is proposing to treat it, and I am looking forward to hearing that, but his work has been quite outstanding in this field.

The following lecture, which was illustrated by lantern slides, was then delivered:

THE LECTURE

Previous lectures have dealt with a number of aspects of Sir William Pope's life and scientific career, and Sir Robert Robinson, as chairman for the previous lecture, pointed out that most of the aspects of a biographical character have already been covered, and that Sir Alexander Todd was proposing to lecture on a subject in which he himself had been particularly interested, namely 'The Chemistry of Nucleic Acids'. I feel that I must follow this example, although perhaps I might add just a few remarks about the subject of these memorial lectures.

I have chosen a provocative title for this lecture and I think Sir William himself would have enjoyed the reversal of what is usually understood. It is common to speak of the debt of medicine to chemistry, and this indeed is very great, but I hope to be able to convince you, by the end of this lecture, that the reverse is also true. Sir William himself was very fond of provocative

arguments and I well remember on one occasion being present when he became engaged in an argument with Sir Almroth Wright, himself a very provocative person. Sir Almroth attacked Sir William on the grounds of his using his genius and chemical ability for warfare purposes and referred to the fearful intellectual responsibility that Sir William had for his work on mustard gas. Sir William immediately turned on Sir Almroth and pointed out that his contribution to war was very much more effective than his own. Prior to the introduction of the anti-typhoid vaccine it was impossible to keep an army of more than about 100,000 men in the field, because if this figure were exceeded the rate of typhoid carriers rose sufficiently to give a continuous series of epidemics with the result often that the army lost its striking force. Owing however to Sir Almroth's brilliant discovery of the protective effects of the T.A.B. vaccine, armies of any size were able to be present in the field, and I saw Sir Almroth for once in his life without a ready answer. Those who remember Sir William in his later years will recall that he suffered from a very severe nervous affection which produced a rigidity of the neck muscles. This caused him great pain and discomfort which he bore with great fortitude. Whenever any new medical appointment was made in the University of Cambridge, it was always a set ritual that they tried to cure Sir William's affliction and he submitted to this, again with philosophic resignation. On one occasion the medical man then in the saddle decided that Sir William should see a psychiatrist, and again he meekly agreed to do this. I shall always remember waiting for him at lunch after he had been to his first consultation. Apparently the psychiatrist gave him a mirror and told him to hold it out at arms' length and look into it. This he did, and the psychiatrist, after a time, asked what was passing through his mind. Sir William replied that his arm was aching and that if he could only put the mirror on the mantelpiece he thought it would be better. The psychiatrist then decided that he could go no further with this obviously psychiatric-resistant case.

The early history of chemistry is very closely tied up with that of medicine, as most of the chemists obtained their inspiration from pharmacy and from a study of drugs of natural origin. Many of the mediæval chemists actually practised some form of medicine. The first half of the last century was devoted mainly to studying the constitution of many of the naturally occurring substances of which drugs predominated, and the latter half of the century was devoted mainly to the synthesis of these naturally occurring substances. With the extension of the science of synthetic organic chemistry, it became obvious that it was possible to produce substances other than those that existed on the surface of the earth, and the science of what one might term 'pure' or theoretical synthetic organic chemistry was studied. In a way synthetic organic chemistry could be compared to mathematics which can be classified into pure and applied. Applied mathematics deal with the actual practical problems and would correspond to the synthesis in organic chemistry of substances in nature. Pure mathematics, on the other hand, deal with abstract questions unrelated to reality, and pure synthetic organic chemistry could be described as a synthesis of compounds merely for the sake of studying their properties and for the development of the

technique of synthesis. I hope to show in this lecture that the stimulus of some of the newly discovered substances in the animal body, and in the realm of microbiology, have stimulated the organic chemist to much greater efforts than I think his own imagination would ever have done. Therefore, I think that perhaps I shall have little difficulty in convincing you that medical science has indeed added a good deal to the subject of organic chemistry.

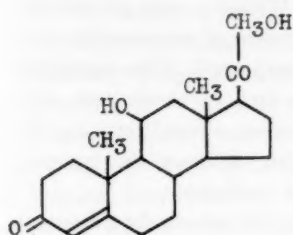
We might perhaps start with a consideration of the hormones. One would search a long time to find a better example of my thesis than in those interesting chemical substances secreted by the cortex of the suprarenal gland. In order to give you the complete picture it is necessary to go back almost exactly to 101 years ago when Thomas Addison, a physician at Guy's, published in the Guy's Hospital Report a paper which has become a medical classic. He described the post-mortem findings on a series of patients who presented the same clinical picture during life. Their symptoms consisted of extreme lassitude associated with pigmentation, wasting and gastrointestinal disturbances. The post-mortem findings showed a complete destruction of the two small glands situated at the end of the kidney and known in those days as suprarenal capsules. The cause of this destruction was practically always due to a tuberculous infection. The disease is now known as Addison's disease and with the growth of knowledge during the last hundred years we know that the symptoms are due to lack of an internal secretion or hormone produced by the suprarenal cortex. Removal of both of these bodies is always attended by death and therefore we can say that the suprarenal tissue is the only one in the body which is essential to life. When the endocrine mechanism was understood, it was only natural that chemists and biochemists should seek some form of extract of the gland which could be administered to patients with this disease. The search was not successful until 1930 and this was mainly due to the fact that there was no really accurate and clear-cut method of testing the extract. Whilst it is true that laboratory animals when adrenalectomized invariably die, it was not until the 1920s that administration of extracts to such animals was developed into a roughly quantitative method of standardization. The American workers Swingle and Pfifner were the first to produce a stable active substance that could be administered to animals and human beings. This was an extract made from slaughter-house material and was of course of unknown constitution. It was capable of maintaining adrenalectomized animals in a state of health and was used successfully in the treatment of Addison's disease. This material answered all the clinical needs of the day and, but for certain new discoveries of which I will tell you shortly, would undoubtedly still be in use and satisfying the clinical needs for the treatment of adrenal insufficiency due to Addison's disease and other similar or allied conditions.

To develop my story we must now turn to another group of workers. The period between 1920 and 1930 saw very great chemical developments in our knowledge of the structure of cholesterol and allied substances, and by the 1930s the structure of cholesterol was agreed upon by all interested research workers. The recognition of a basic cyclopenteno phenanthrene ring system gave a very great stimulus to research in bodies which were thought to have properties

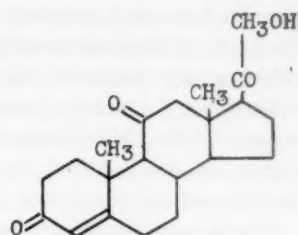
similar to the sterols. Very quickly the constitution of the sex hormones, oestrone, progesterone and testosterone were elucidated and they of course were all found to belong to this cyclopenteno phenanthrene ring system of compounds. In view of the lipoidal nature of the cortex of the suprarenals, a detailed study was undertaken of the substances present there and in the early 1930s a series of papers began to emanate from two laboratories, one in the Mayo Clinic, that of Professor E. C. Kendall, and the other one in Basle under Professor Reichstein. Both these workers pursued their investigations independently and they were able to show that the active principles of the suprarenal cortex also belonged to this cyclopenteno phenanthrene ring system of compounds. Some fifty substances have now been isolated and identified but the two most important are corticosterone and dehydrocorticosterone (see formulæ Figure 1). Both of these substances are capable of maintaining the adrenalectomized animal in good health and presumably would also be capable of controlling the symptoms of Addison's disease. It must be pointed out, however, that these substances have been isolated in minute quantities from literally tons of slaughter-house material and, therefore, are extremely valuable and only, at least at this stage, of theoretical interest.

Up to 1948, therefore, we have this position. From the clinical angle the physicians are entirely satisfied with the Swingle-Pfifner extract of unknown constitution, and the chemists having produced a series of compounds of apparent academic interest only. As I said earlier over fifty substances of the corticosterone type have been isolated from the suprarenal cortex and it is not proposed to go into the constitution of these substances, with one exception, and that is the substance which Kendall referred to as 'Compound E' (see formula Figure 1). This in effect, as can be seen from the formula, is corticosterone with an additional hydroxy group attached to the 17 carbon atom. Kendall isolated this substance from the suprarenal cortex obtained from slaughter-house material and obtained a few grammes of it. As he himself said afterwards, he had a kind of sentimental interest in this compound as the determination of its constitution had presented very great difficulties. Up to 1948 this substance was simply one of the fifty-odd compounds isolated from the suprarenal cortex and was of no practical significance.

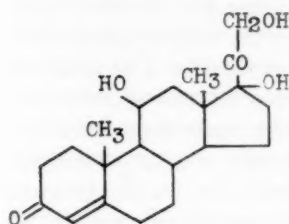
We must now turn to another group of workers, in this case clinicians. A team at the Mayo Clinic, under Dr. Hench, had been investigating the clinical history and nature of the disease rheumatoid arthritis. They had confirmed the old statement that a person with rheumatoid arthritis would experience a remission when certain intercurrent conditions or diseases supervened. Two of the most potent causes of remissions in this chronic rheumatoid arthritis were firstly an attack of jaundice, and secondly the incidence of pregnancy. Hench and his collaborators were able to show that if a patient with severe rheumatoid arthritis with limitation of movement of joints, pain and so forth, experienced a severe attack of obstructive jaundice there was an immediate improvement in the symptoms of the condition; thus joints which had been either immovable or had been very restricted became much freer, pain largely disappeared. When, however, the jaundice was relieved it was noted that the condition returned



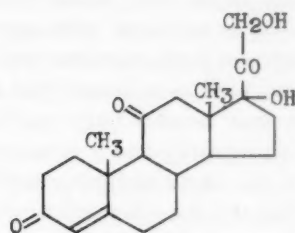
Corticosterone.



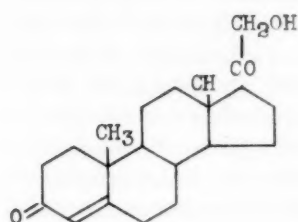
Dehydrocorticosterone.



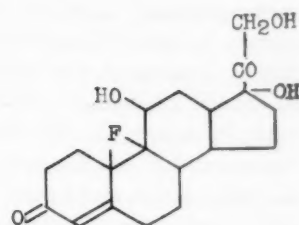
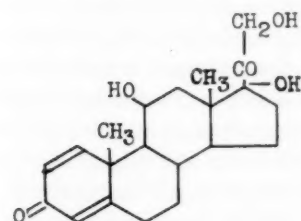
Cortisone, 'Compound E'.



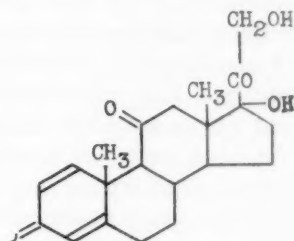
Dehydrocortisone.



Dehydroxycorticosterone

9 α fluoro cortisone

Prednisone



Prednisolone

FIGURE 1

with its full previous severity. The result of a woman with severe rheumatoid arthritis becoming pregnant was even more striking. Within a very short while the pains of rheumatoid arthritis, restriction and limitation of movements, were either greatly improved or symptoms practically disappeared. This continued throughout the whole pregnancy and remained for two to three days after delivery of the child. When delivery had occurred, however, a rapid return of the symptoms resulted and by the end of the week after delivery the patient's rheumatoid condition was just as bad as before the pregnancy.

Hench naturally tried to connect these two conditions and sought for a common factor. We know that in jaundice there is reabsorption of the bile including its cholesterol and bile salts, and these circulate freely in the blood and diffuse into all the body fluids. We also know in the case of pregnancy that the whole body is saturated with oestrogens. In most animals these are excreted in the urine in large quantities and it is well known that the urine of the pregnant mare was used as a commercial source of oestrone for many years. The pregnant woman secretes large quantities of oestriol in her urine throughout the whole of pregnancy and it is possible to identify this and other oestrogenic hormones in the blood and other body tissues. Here Hench thought was the connecting link and the substance which is produced in the remission may be of a steroidal character. He then started to try all the known steroidal substances upon which he could lay his hands; cholesterol and a number of phyto sterols were investigated as were the sex hormones both male and female and progestational. The results were uniformly negative. He then turned to the question of the suprarenal cortex, the only other tissue to produce steroidal hormones. He tried the Swingle-Pfifner extract and this was valueless, having no effect at all, and had to be added to the list of inactive compounds already mentioned. Discussing the matter with Professor Kendall he decided to try this 17-hydroxy compound, or 'Compound E' as Kendall had described it. As this material was made from slaughter-house glands and the yields were small they only had a very limited amount of material and therefore decided to limit their injections to a hundred milligrammes. All of you will remember the great sensation that the announcement in 1948 and 1949 made on the medical and general public. Hench described his researches in very great detail with almost quantitative data on his cases. These researches showed that after three injections of a hundred milligrammes per day of 'Compound E' a miraculous reversal of the symptoms of rheumatoid arthritis occurred. The remission was very nearly as good as that obtained in pregnancy and was on the whole better than that appearing in jaundice. Joints that could not move previously became freely movable, pain diminished or was abolished, and above all the patient experienced a feeling of well-being or euphoria which is very striking indeed. Unfortunately, if the administration of the substance was interrupted all the symptoms returned and the euphoria disappeared and the patient was in a condition even a little bit worse than he started. The great interest from the medical point of view in these investigations was a demonstration that the rheumatoid arthritic process was a reversible one. The old observations on the remissions caused by jaundice and pregnancy had been

forgotten until they were revived by Hench and the medical profession was faced with what appeared to be an entirely new situation, namely the reversal of a pathological process which had hitherto been regarded as irreversible and continuously progressive. The dilemma of the medical profession can well be imagined. Here was an apparent method of almost curing, or at least greatly improving, this very distressing condition, which is responsible for the greatest loss of man-hours in industry, yet the material, 'Compound E' is so scarce as to be literally unobtainable. I should doubt if organic chemistry has ever been presented with a more interesting, and at the same time more difficult, problem than the production of 'Compound E' or cortisone as we now know it.

To solve this problem required all the ingenuity and chemical erudition of the experts in this field. The total synthesis of a substance like cortisone on a commercial scale, certainly at that time, was out of the question. Not only would the synthesis present the greatest difficulties from a purely structural point of view, but the problems and difficulties brought in through stereoisomerism are too formidable even to be contemplated.

The introduction of a ketone or hydroxyl group in position 11 of the steroidal hormones again is not possible, as no technique is known whereby this could be done. It is interesting at this point to note that practically all the sex hormones are prepared now by a partial synthesis from cholesterol which has previously been degraded by treatment with chromic acid. This oxidizes off the side-chain attached to the 17-position and leaves a substance, dehydro-iso-androsterone, which can be used as the starting point for the synthesis of any of the known sex hormones. It is possible to make a substance very similar to cortisone and corticosterone using this substance as a starting point. This is known as dehydrocorticosterone or DOCA (see formula Figure 1). This possesses some of the properties of corticosterone and is particularly valuable for its powers of retaining electrolytes in the human body. It will, however, not completely replace these substances and when tested for an anti-rheumatic effect was found to be completely inactive. One would have thought that it ought to be possible to produce cortisone, or corticosterone, from this substance but as I have already pointed out there is no known method of introducing a hydroxyl or ketone group in the 11-position by chemical means.

The problem was eventually solved by starting with deoxycholic acid, a substance obtained from slaughter-house bile. Amongst other groupings this possesses a hydroxyl group in the 12-position and by brilliant synthetic methods it is possible to move this from the 12 to the 11 position and also to build the rest of the molecule so that cortisone results. This process, which takes over thirty stages, is the one by which cortisone was produced until comparatively recently. This surely must represent one of the greatest triumphs of organic chemistry. To undertake this production, even on a laboratory scale, ten years ago would have been regarded as little short of miraculous, but to adopt the processes of a research laboratory to the works and operate a complicated process like this on a tonnage basis, must as I say be the greatest triumph of chemistry applied to the fine chemical pharmaceutical industry.

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The demonstration of the anti-rheumatic qualities of cortisone led to an intensive research into other starting materials for the synthesis and we now have a number of new ones apart from deoxycholic acid. One that is used extensively in this country is a sterol present in sisal waste, namely hecogenin. This substance can be obtained from parts of the British Commonwealth and, therefore, avoids the necessity for dollar expenditure, and it is a cheaper starting material, even apart from this consideration, than deoxycholic acid.

The need for cortisone has produced some very striking changes and developments in the production of steroidal substances. One of the most interesting is the entry of the microbiologist into this field. Up till the time when there was this demand for cortisone it was thought that the sterols were the exclusive perquisite of the synthetic organic chemist, but the microbiologist has broken into his stronghold and produced some very remarkable results. Peterson, of America, has succeeded in producing cortisone from progesterone, which can be produced in large quantities and cheaply, from plant sources. The micro-organisms that induce these strange changes are moulds and it is possible to produce moulds that will hydroxylate progesterone in the three positions necessary to give cortisone. This method is now in use as an alternative to the very elaborate synthesis which has already been mentioned. I am sure you will agree that it is very doubtful if the organic chemist, and certainly sure that the microbiologist, would never have entered this field, but for the interest created by the clinical observers.

The organic chemist, not content with producing cortisone, has introduced a number of variants which are proving to be of interest from the clinical point of view. Cortisone and dehydrocortisone (see formulæ Figure 1) are now used extensively in the treatment of a number of conditions known as the collagen diseases. These include rheumatoid arthritis and the hitherto fatal condition known as *lupus erythematosus diffusus*. Two other new compounds are at present receiving very great attention from the clinicians, and these are known as prednisone and prednisolone (see formulæ Figure 1) and correspond with cortisone and dehydrocortisone but that they have in addition an extra double bond in ring A. These substances are stated to be many times more active than cortisone and doses of a very few milligrammes are said to be able to keep the patient under control. Another fascinating development is a series of compounds with a fluorine atom in the 9 α -position. 9 α -fluoro-cortisone (see formula Figure 1) has received a good deal of clinical attention, but it is no use in the treatment of rheumatoid arthritis as it causes salt retention to a dangerous degree when given in large quantities. It is, however, of great use in the treatment of certain conditions such as Addison's disease, acute adrenal insufficiency and so forth.

Another very good example can be quoted from the work of my colleagues, Mrs. Simpson and Dr. Tait. After having established a new method of testing steroids for their salt retaining qualities, they applied the method to an investigation of the Swingle-Pfifner extract. After a brilliant series of experiments they were able to produce evidence that indicated that there was in this extract a mineralocorticoid much more powerful than anything hitherto known. By its

behaviour on chromatographic studies they were able to convince themselves that this substance was an entirely new one. They were able to isolate it in a pure form and it was called 'Electrocortin' (later called 'Aldosterone'). Later, together with Professor Reichstein and his colleagues, they were able to identify its constitution and this is shown in Figure 2.

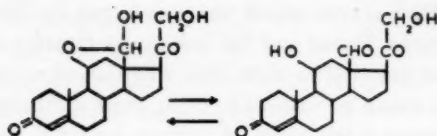


FIGURE 2. *Aldosterone*

One might point out that this is an entirely new departure in the formula of compounds of this type and is the first occasion where the angle methyl group between ring C and D has been shown to be modified. One form with the oxygen bridge to the 11-position is particularly interesting. This opens up a new series of possibilities of steroids of this type of configuration and surely again this could never have been evolved without the primary biological observation.

We can, therefore, see that the original medical observation has caused a very great deal of pure chemical research resulting in the great increase of knowledge purely from the chemical point of view. It is, of course, not the purpose of this lecture to discuss the medical aspects solely and it is advisable to point out that whilst these cortisone-like substances possess very great beneficial qualities, they also are double-edged weapons and, if used indiscriminately, can do a great deal of harm. We do not really understand how they produce their effect, but we know that this is beneficial in a number of clinical conditions and, when they are used with caution and care, they make a good contribution to the alleviation of human suffering. It would be possible to give many more examples than the hormone field, but I should like to turn from this to another extremely fascinating development of recent years which, whilst giving entirely new weapons to combat disease to the medical man, have provided the chemist with a new series of compounds which, I feel sure you will agree, could never have been conjured up out of any purely theoretical or pure approach *via* synthetic organic chemistry.

I would like to take as my next example the antibiotics, of which we may start with penicillin. The history of the discovery of penicillin is so well known that we need only refer to it in general. Sir Alexander Fleming observed in 1929 the astonishing fact that, when a mould dropped on one of his cultures in a petri dish, as the mould developed so the bacteria in the immediate surrounding disappeared, and he came to the conclusion that the mould produced a substance which actually killed the bacteria and he suggested the name of penicillin. He was able to show that this substance could be extracted from the mould and that

it was capable of killing bacteria in vitro. He suggested that the substance would certainly be useful in the classification of bacteria as it only killed certain types and might possibly be of use in the application to superficial wounds. From 1929 onwards a number of workers tried to produce the substance in a pure form, or in any case in such a state that it could be used. Time does not permit our reviewing many of the gallant attempts which failed and we must proceed to the first successful research which was conducted by Sir Howard Florey in his Oxford Laboratories. Florey and his colleagues Heatley and Chain were able to produce sufficient material to show that when injected into infected animals complete protection could be obtained. With great difficulty they succeeded in making enough to treat a few cases of human bacterial infection and showed again that the substance was highly effective.

AMERICAN COMMON NAME	BRITISH COMMON NAME	CHEMICAL NAME	R GROUP
Penicillin G	Penicillin II	Benzylpenicillin	
Penicillin K	Penicillin IV	<i>n</i> -Heptylpenicillin	
Penicillin X	Penicillin III	<i>p</i> -Hydroxybenzylpenicillin	
Penicillin F	Penicillin I	2-Pentenylpenicillin	
Dihydro-penicillin F	Dihydro-penicillin I	<i>n</i> -Amylpenicillin	

FIGURE 3. *Penicillin* (Doerge, R. F., 1954, Text-book of Organic, Medicinal and Pharmaceutical Chemistry, 2nd Ed., J. B. Lippincott Co.)

From these observations developed the great fermentation industry of America and this country where penicillin is produced in great quantities and is now a universal remedy for general and local infections. The introduction of penicillin has completely changed the whole face of medicine. Diseases which were hitherto regarded as incurable are now dismissed by a few injections of this substance and diseases such as pneumonia and the venereal diseases, which are a scourge to humanity, have literally been relegated almost to footnotes in textbooks of medicine. The social implications of penicillin and the whole of the antibiotic series of remedies are very great indeed. There is no doubt that the whole structure of society will be altered by these important drugs, because of the fact that they eliminate many of the killing diseases. For example respiratory diseases, such as pneumonia, bronchitis and so on, were very high up in the list of killers and the virtual elimination of these has greatly increased the expectation of life so that to-day one can see already the effects of prolonging life. This is resulting in the accumulation of more and more people at the latter end of the span of life and it can be calculated that in the future the population will be overburdened with elderly people who presumably will depend on the younger for their support.

20TH JULY 1956

THE DEBT OF CHEMISTRY TO MEDICINE

Great and interesting as is the medical and bacteriological interest in this substance, penicillin, which despite its great potency is practically without toxic effects, its chemistry is perhaps even more fascinating. The constitution is shown in Figure 3 and represents an entirely new type of organic compound. I think it is fair to assume that no amount of pure speculation even of the most imaginative of the organic chemists could have evolved such a structure. Even more elaborate is the compound, streptomycin and its derivative, aureomycin, whose structures are shown in Figures 4 and 5. Again, these represent an entirely new type of organic compound and they have been obtained through the study of organisms obtained from soil. These organisms are of the streptomyces variety

and they produce an infinite number of compounds of the streptomycin type. Again, another interesting compound was revealed in the study of the antibiotic, chloromycetin, or chloramphenicol. This substance, whose formula is shown in Figure 6, is the first one in nature in which a para-nitro group has been found attached to a benzene ring. From the medical standpoint chloromycetin is of the greatest interest because unlike the other antibiotics it attacks infective agents which are approaching the size of viruses. It is shown that chloromycetin may cure the rickettsia type of infection of which various forms of typhus are the best known. This is of the very greatest interest from the medical point of view and has succeeded in changing the conditions of many places in the tropics which hitherto were considered extremely dangerous from the point of view of typhus infection.

Again it is possible to turn to another series of examples which are provided by a study of the chemistry of the vitamins. For example, Vitamin A represents a type of compound in which the chemists have shown little interest and the same applies certainly to Vitamins B₁ and B₂. One of the most interesting examples that one can quote is the recent work on Vitamin B₁₂ (Figure 7). Again, I think

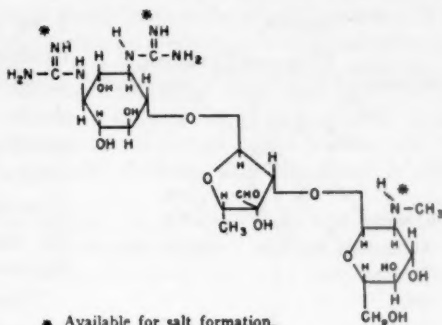


FIGURE 4. *Streptomycin*

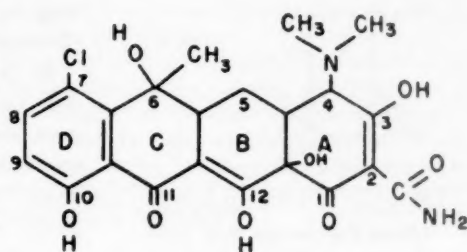


FIGURE 5. *Aureomycin*

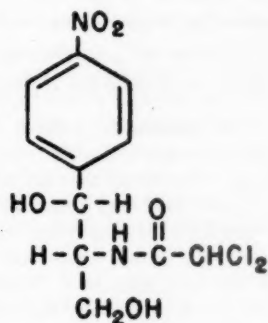


FIGURE 6. *Chloromycetin*

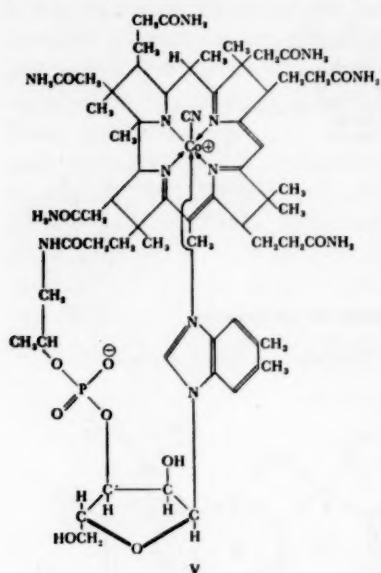


FIGURE 7. *Vitamin B₁₂*
(From Endeavour, Jan. 1956.
Johnson, A. W. and Todd, A.)

I am right in saying that the organic chemist had very little interest in organic compounds containing cobalt, and again I doubt very much whether even the most erudite would have thought of making a substance with anything like the complexity of formula as that of Vitamin B₁₂ of which the latest series of extraction is shown in Figure 7.

This substance has proved of the greatest interest not only in human blood disease and nutritional disorders but in those of animals and a study of its activity goes a long way to explain the importance of trace elements in animal feeding.

In conclusion I hope that my examples will have convinced you that chemistry does owe a great deal to the biological sciences and particularly to medicine. Many more examples than those quoted above could be given. Everything seems to indicate in the future that more and more new substances will be found in

nature and it is highly probable that many new forms of structure will be demonstrated to provide the organic chemist with further material on which he can exercise his art. Fortunately, to-day there is a close co-operation between medicine, biochemistry and organic chemistry, and if we take only the examples that have been quoted to-day as specimens of what this collaboration can offer, we can well see that a continuation of this in the future will surely pay handsome dividends.

The situation can perhaps be rather neatly summarized by a remark attributed to Professor Kendall, the discoverer of cortisone. On remarking upon the value of co-operation between medicine and chemistry he is reputed to have said that whereas he had taught Dr. Hench to say '17-hydroxy-11-dehydrocorticosterone', on the other hand Dr. Hench had taught him, a chemist, to say '*lupus erythematosus diffusus*'.

THE CHAIRMAN: I think everyone will agree that Sir Charles Dodds has given us a most masterly account of what must be one of the most wonderful stories of modern times. His thesis that chemistry owes a good deal to medicine is not one which the chemists find very provocative, but one which commands quite ready assent.

Sir Charles began by telling us some stories about W. H. Perkin, Jnr. On one occasion, Perkin examined a thesis about synthetic organic chemistry and beaming at the candidate said, 'I see, Mr. X., that you have prepared 24 new compounds'. The young man, looking rather pleased, said that he had, and Perkin went on, 'What on earth did you do it for?' In fact, the reasons for making these substances had not been at all clear. Over a hundred thousand compounds are known to organic chemistry

20TH JULY 1956

THE DEBT OF CHEMISTRY TO MEDICINE

and there is no reason to suppose that there is any limit to the possible number. The principle of selection offered by the requirements of medicine is a most valuable one and organic chemistry would be the poorer if it did not exist. Nature, after all, is cleverer than man and, as Sir Charles has shown us, many of the clues provided by natural products could not possibly have been dispensed with. On the other hand, I am sure Sir Charles will agree—indeed his whole lecture made it clear that he does—that the organic chemist has accepted the challenge in a way which is itself also a wonderful story.

I shall not put to the vote the thesis that organic chemistry has owed much to medicine. I am sure it would be carried unanimously. What I shall do instead is to propose a hearty vote of thanks to Sir Charles Dodds for his most stimulating and valuable lecture.

The vote of thanks to the Lecturer was carried with acclamation.

DR. R. W. HOLLAND, O.B.E., M.A., M.SC. (Chairman of Council of the Society): As a very old student of W. H. Perkin, Jnr., I have a very pleasant duty to perform in proposing a vote of thanks to our chairman this afternoon.

It is a somewhat strange position for a Professor of Chemistry at Oxford to be gracing the chair this afternoon at a lecture founded in memory of a Professor of Chemistry at Cambridge, but when the occupant of the chair at Oxford comes to the position of President of the Royal Society he must necessarily throw off any question of bias, and hold the balance evenly, as he has done this afternoon in so kindly acting as chairman for Sir Charles. I ask you to give to him your very sincere thanks for the way in which he has conducted the business.

A vote of thanks to the Chairman was carried with acclamation, and the meeting then ended.

GENERAL NOTES

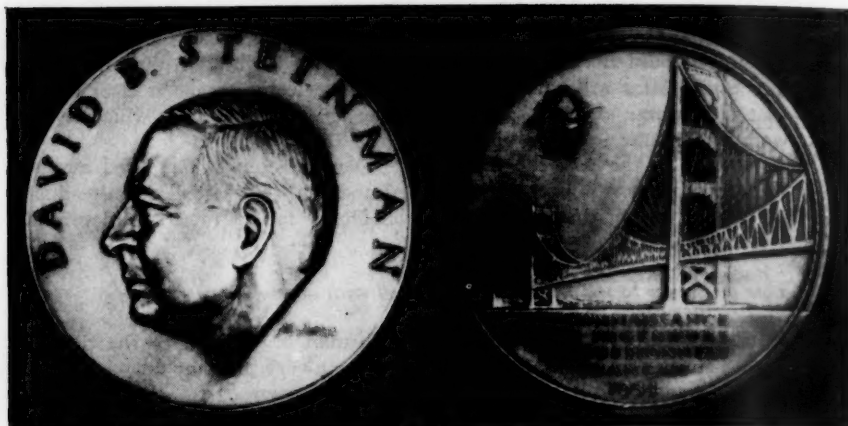
THE DUKE OF EDINBURGH'S STUDY CONFERENCE

A conference, initiated and opened by His Royal Highness the Duke of Edinburgh, is at present being held at Oxford to discuss the human problems of industrial communities within the Commonwealth and Empire. The conference members, of which there are some 300, are young men and women of proved ability from both sides of industry and from all parts of the Commonwealth. They are not representing any organizations and no formal conclusions are expected to result from their deliberations, which will, it is hoped, result in a wider understanding of this complex subject.

The Duke of Edinburgh, in his opening speech on 9th July, referred to the 'four basic ideas at the back of this conference'. Firstly, they had to decide whether lessons from the past could help in overcoming the problems of present industrialization, and secondly, could the new industries of the Commonwealth help each other. Thirdly, conclusions might be formed about factors contributing to a good works, a happy community and a satisfied individual. The final point concerned the 'bewildering variety of shapes' which the simplest industrial problems assumed when viewed from the various standpoints of an industry.

The Conference members are divided into study groups of 15 persons, with people from different parts of the world mixed in each. The conference began with lectures on industrial problems, these being followed by visits to industry and final discussions of the impressions gained.

GIFT OF MEDAL TO THE SOCIETY



A bronze replica of the medal reproduced above has been presented to the Society by the Professional Engineers of France, at the request of Dr. D. B. Steinman, one of its Fellows, in whose honour the medal was struck and to whom it was initially awarded in gold; a bronze replica will be struck annually for award by the Professional Engineers of France. The medal is the work of Professor A. F. d'Andrea, also a Fellow of the Society and Head of the Art Department of the City College of New York.

The reverse of the medal bears Dr. Steinman's design for the proposed Messina Straits Bridge, a five thousand foot main span to connect Sicily to the mainland of Italy.

GLASS DESIGN EXHIBITION

An Exhibition of designs in glass, entitled 'Glass and the Student Designer', by students of the Royal College of Art, Edinburgh College of Art, and Stourbridge College of Further Education, is on view at the headquarters of the Glass Manufacturers Federation, 19 Portland Place, London, W.1, where it will remain until 27th July. The Exhibition is open from 10 a.m. to 4 p.m. on Mondays to Fridays, and 10 a.m. to 12 noon on Saturdays. Admission is free.

COLOUR PRINTS EXHIBITION

With the object of raising the standard of print making and the status of the graphic arts in this country a group of artists have formed themselves into the New Editions Group. The first Exhibition of their work, including lithographs, lino-cuts and etchings, is now on view at the Zwemmer Gallery, 26 Lichfield Street, W.C.2, where it will remain until 15th August. Only a limited number of prints, produced by the artist himself, is made from each design. The Exhibition is open from 10 a.m. to 6 p.m. on Mondays to Fridays and from 10 a.m. to 1 p.m. on Saturdays. Admission is free.

SOUTH AFRICAN PAINTINGS EXHIBITION

An Exhibition of South African paintings by Mr. Walter Battiss, Principal of the Arts Centre, Pretoria, and a Fellow of the Society, is at present on view at the Imperial Institute Gallery, South Kensington, where it will remain until 29th July. The Exhibition, which comprises about fifty extremely original and interesting adaptations of the virile art of the Bushman, is open from 10 a.m. to 4.30 p.m. on Mondays to Fridays, 10 a.m. to 5 p.m. on Saturdays, and 2.30 p.m. to 6 p.m. on Sundays. Admission is free.

OBITUARY

PERCY A. WELLS

We record with regret the death, in London on 6th July, of Mr. Percy A. Wells, at the age of 88.

Percy Wells, who was Principal of the Shoreditch Technical Institute for some thirty years until his retirement in 1933, was of the old school of furniture craftsmen. He did much to maintain the high standard of furniture making in this country, and was made the first Honorary Freeman of the Furniture Makers' Guild for his great services to the trade.

In 1909 he read a paper on 'English Furniture' before the Society, for which he was awarded a Silver Medal. He took a keen and active interest in the Furniture Section of the Competition of Industrial Designs held from 1924 to 1933, and had written a number of books on cabinet making.

Mr Wells was elected a Fellow of the Society in 1909.

NOTES ON BOOKS

THE PENROSE ANNUAL, 1956. Ed. by R. B. Fishenden. Lund Humphries, 35s

This is the fiftieth issue of the *Penrose Annual* and the twenty-first year of the present editor's tenure of office. The jubilee is celebrated modestly, but the majority goes unsung; yet *Penrose* is to-day what its present editor has made it. When Mr. Fishenden was appointed in 1935, the pattern of the annual had been already projected but he has given it form and purpose and consistently high quality.

The general plan is now familiar. A series of articles on design comes first, with a far-reaching review by the editor; then follow a group of technical articles, next the 'illustrations of the year', and finally advertisements. The outline is filled in by the editor and given aim and balance.

Penrose began in 1895 as a purely technical yearbook for the process trade. It was not until Lund Humphries became the proprietors that it began to appeal to a wider field, and to contain articles on design. Since Mr. Fishenden became the editor it has also become itself an interesting example of design, different each year.

In the general articles there is an undercurrent of emphasis upon the unity of art, implied in articles on the illustrations of William Nicholson and E. McKnight Kauffer, and clear in Charles Rosner's article on the indivisibility of art. The theme is pursued further in a pretentiously written review of American graphic art. Beatrice Warde's lively discourse on the meaning of words and typographic legibility is a relief from this, and an example of how to write to be read.

A handful of articles on type and lettering drive home the truth that a good letter is a legible letter and something more. John Dreyfus discusses, among other scripts, the astonishingly effective Mistral, and Vivian Ridler considers, without enthusiasm, the merits of Linotype's Minerva.

The technical articles in *Penrose* always have a forward emphasis; if there is a new invention of promise, *Penrose* will have an article on it. The bias is still towards process work, or one of the many variations upon it—lithography, gravure, auto-screen plates, the Scan-a-sizer, and so on. Photo-composition, which used to occupy our thoughts so much, is represented this year only by an article on a machine for setting Chinese.

At the end of *Penrose* comes what is one of the most purely enjoyable of its features, the 'illustrations of the year'. This is a heterogeneous picture book which provides me with the childish pleasure of turning page after page to find each time something rich and strange and quite inconsequent. After this come the trade advertisements,

many of which fall dismally short of the standards of taste and design which are typical of *Penrose*.

The jubilee issue is certainly one of the best issues of recent years; and, as the *Penrose Annual* has always been, it is, physically and aesthetically, remarkable value for money.

SEÁN JENNETT

SHORT NOTES ON OTHER BOOKS

THE GRASS ROOTS OF ART. By *Herbert Reed. Faber, 1955. 18s*

An analysis of some of the factors which have accounted for great periods of art in the past, and suggestions of the changes which would be necessary to make our industrial age more conscious of creative values, form the theme of these lectures on the social aspects of art. There are 36 photographic illustrations in this revised edition of the book first published in New York in 1946.

NEW HORIZONS IN COLOUR. By *Faber Birren. Reinhold, 1955. 80s*

Mr. Faber Birren in his book writes on the problems of the dynamics of seeing and of illumination, colour and form. Further chapters are devoted to the application of colour and lighting in public buildings including schools, hospitals, industrial plants, office buildings, hotels and so on. The desirability is stressed of limiting ranges of colours, particularly in the paint industry, for economic and maintenance reasons.

There are over 150 photographs, of which six are in full colour.

FROM THE JOURNAL OF 1856

VOLUME IV. 25th July, 1856

From a report on a fête held in connection with The Warkworth Mechanics' Institution.

Mr. Cantrell, as president, addressed the meeting upon the present condition and future prospects of the Institution. He characterised their position as a peculiarly happy one, and looked with hope for the future. The Rev. J. Edwards then proposed the following sentiments — 'Prosperity to the Warkworth Mechanics' Institution, and to all similar Societies, as the chief sources and most effective promoters of the intellectual cultivation of the people'. — The Rev. F. H. Brett cordially seconded the sentiment. — Mr. E. Edwards proposed the next sentiment: 'The continued enlargement of the means for the cultivation of taste among the people, and for the development of the great mechanical and engineering skill of the English nation', which he enforced by some judicious remarks and allusions to distinguished men who, by cultivating their minds, had raised themselves to their present proud position. — Mr. J. Fryer seconded the resolution. — Mr. Poyser moved the next sentiment: 'The education of the people, as the means of the development of those high faculties with which the All-wise has endowed man; and, as, in this view, the source of the highest and purest earthly enjoyment'. — Mr. M. H. Cantrell seconded the resolution. — Dr. Webb introduced the next sentiment: 'The press, as the greatest providential manifestation of human means for promotion and securing the advancement of literature, science, and civilization', and eloquently pleaded the cause of the Institution. — Mr. W. Wright seconded Dr. Webb's resolution. — Mr. E. Wass proposed, 'The principles upon which these societies are based are those which, while they leave to every man the right of free judgment, yet, from their universality and truth, tend to produce in society the greatest amount of general good'. — Mr. Carrington seconded the resolution. — Mr. Stone proposed 'The Ladies', whose presence that day was one of the good things of the *fête*.